AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

58. (Previously presented): A syringe comprising a hollow body with first and second open ends and an inside wall of varying inside diameter extending between the first and second open ends, a needle retraction mechanism insertable into the body through the second open end, a plunger having a forwardly extending plunger head insertable into the body through the second open end behind the needle retraction mechanism, and a needle extending forwardly of the first open end, wherein:

the body comprises a nose adjacent to the first open end, a barrel adjacent to the second open end, and a transition zone connecting the barrel and nose;

the needle retraction mechanism comprises an elongated needle holder, a compressed retraction spring, and a retainer member;

the elongated needle holder further comprises a needle holding portion secured in fixed relation to the needle, a reduced diameter portion at one end of the needle holding portion, the reduced diameter portion extending forwardly through the first open end; a head at another end of the needle holding portion opposite the reduced diameter portion; a fluid path extending longitudinally through the needle holder in fluid communication with the needle and with a variable fluid chamber inside the body between the needle holder and the plunger;

the needle holding portion is grounded inside the nose adjacent to the first open end by a barrier limiting forward motion of the elongated needle holder inside a front portion of the nose prior to or during retraction;

the compressed retraction spring is positioned prior to retraction in an annulus disposed between the needle holding portion and the inside wall of the hollow body;

the plunger head is aligned to separate the retainer member from the head of the needle holding portion and release the compressed retraction spring during retraction; and

the plunger comprises a retraction cavity into which part of the retraction mechanism is received during retraction so that the needle no longer extends forwardly of the first open end.

59. (Previously presented): The syringe of claim 58 wherein the inside diameter of the barrel is larger than the inside diameter of the nose, and the inside diameter of the transition zone tapers inwardly between the barrel and the nose.

60. (Previously presented): The syringe of claim 58 wherein the inside wall of the body comprises an annular shoulder proximal to the first open end that is the barrier limiting forward motion of the elongated needle holder inside a front portion of the nose.

61. (Previously presented): The syringe of claim 58 wherein the plunger head further comprises a tip forming an opening into the retraction cavity.

62. (Previously presented): The syringe of claim 61 wherein a resilient dislodgeable stopper is positioned in the opening into the retraction cavity.

63. (Previously presented): The syringe of claim 62 wherein a front portion of the dislodgeable stopper extends forwardly of the tip.

64. (Previously presented): The syringe of claim 58 wherein the plunger head further comprises a seal slidably engaging the inside wall of the barrel.

65. (Previously presented): The syringe of claim 64 wherein the seal is mounted in a fixed axial position on the plunger.

66. (Previously presented): The syringe of claim 58 wherein the plunger further comprises a rear end portion opposite the plunger head, and a thumb cap at the rear end portion.

67. (Previously presented): The syringe of claim 66 wherein the thumb cap has an opening.

68. (Previously presented): The syringe of claim 67 wherein a closure is installed in the opening and the retraction cavity is vented.

69. (Previously presented): The syringe of claim 66 wherein the barrel comprises a collar adjacent to the second open end, and the thumb cap fits in close proximity to the collar when the plunger is depressed during retraction.

70. (Previously presented): The syringe of claim 69 wherein the plunger end cap is lodged in the barrel collar by pressing the plunger to cause retraction.

71. (Previously presented): The syringe of claim 58 comprising a one-piece barrel.

72. (Previously presented): The syringe of claim 58 wherein the retainer member is positioned at the most constricted portion of the transition zone prior to retraction.

73. (Previously presented): The syringe of claim 58 wherein the retainer member is coupled to the needle holder head with a holding force which exceeds a retraction force applied to the needle holder head by the compressed retraction spring.

74. (Previously presented): The syringe of claim 58 wherein the nose comprises an annular space between the inside wall and the retraction spring into which the retainer member is forced by the plunger head during retraction.

75. (Previously presented): The syringe of claim 58 wherein the needle is inserted into the reduced diameter portion of the elongated needle holder extending forwardly of the body and is attached to the elongated needle holder.

76. (Previously presented): The syringe of claim 58 wherein the inside wall of the body forwardly of the transition zone cooperates with the needle holder as a spring guide during compression of the retraction spring.

77. (Previously presented): The syringe of claim 58 wherein the retainer member has an outside mating surface making a seal with the inside wall.

78. (Canceled)

79. (Previously presented): The retraction mechanism of claim 61 wherein the retraction mechanism is releasable by forward movement of the plunger to disengage the retainer member from the needle holder head without contact between the plunger seal element and the retainer member.

80. (Previously presented): The syringe of claim 58 wherein the retainer member acts as a fluid seal for the variable fluid chamber prior to retraction.

81. (Previously presented): A syringe comprising a hollow body with first and second open ends and an inside wall of varying inside diameter extending between the first and second open ends, a needle retraction mechanism, a plunger having a forwardly extending plunger head insertable into the body through the second open end, and a needle extending forwardly of the first open end, wherein:

the body further comprises a nose adjacent to the first open end, a substantially cylindrical barrel adjacent to the second open end, and a transition zone connecting the barrel and nose;

the needle retraction mechanism comprises an elongated needle holder, a compressed retraction spring, and a retainer member holding the retraction spring in compression prior to retraction;

the elongated needle holder further comprises a needle holding portion secured in fixed relation to the needle and a head opposite the needle holding portion, the needle holding portion extending forwardly through the first open end; a fluid path extending longitudinally through the needle holder in fluid communication with the needle and with a variable fluid chamber inside the body between the needle holder and the plunger;

wherein the needle retraction mechanism is grounded inside the nose by a barrier limiting forward motion of the elongated needle holder inside a front portion of the nose prior to or during retraction;

the compressed retraction spring is positioned prior to retraction in an annulus disposed between the needle holder and the inside wall of the hollow body;

the plunger head comprises a seal mounted in fixed axial relation to the plunger, the seal slidably engaging the inside wall of the body;

the plunger head advances beyond a portion of the needle holder following injection to release the compressed retraction spring during retraction;

the plunger comprises a retraction cavity into which part of the retraction mechanism is received during retraction so that the needle no longer extends forwardly of the first open end; and

the plunger comprises an end cap having an outer periphery, the outer periphery being disposed in close proximity to the second open end of the body during retraction to prevent reuse of the syringe.

82. (Previously presented): The syringe of claim 81 wherein the inside diameter of the barrel is larger than the inside diameter of the nose, and the inside diameter of the transition zone tapers inwardly between the barrel and the nose.

83. (Previously presented): The syringe of claim 81 wherein the barrel comprises at least one radially extending member having a front side and a back side, the front side providing finger grips for the syringe body, and a collar comprising an open back end, the collar extending rearwardly behind the back side of the at least one radially extending member and longitudinally separating the back side of the at least one radially extending member from the open back end, and wherein the end cap has an outer periphery that fits closely inside the collar when the plunger is depressed during retraction.

84. (Previously presented): The syringe of claim 81 wherein the retainer member is positioned at the most constricted portion of the transition zone prior to retraction.

85. (Previously presented): The syringe of claim 81 wherein the retainer member is coupled to the needle holder head with a holding force which exceeds a retraction force applied to the needle holder head by the compressed retraction spring.

86. (Previously presented): The syringe of claim 81 wherein the needle is inserted into the needle holder through a portion of the needle holder extending forwardly of the body and attached to the needle holder.

87. (Canceled)

88. (Previously presented): The syringe of claim 81 comprising a one-piece body.

89. (Previously presented): The syringe of claim 81 wherein the inside wall of the body forwardly of the transition zone cooperates with the needle holder as a spring guide during compression of the retraction spring.

90. (Previously presented): The syringe of claim 81 wherein the retainer member has an outside mating surface making a seal with the inside wall.

91. (Previously presented): The syringe of claim 81 wherein at least a portion of the retraction mechanism is received into the retraction cavity during retraction.

92. (Previously presented): The syringe of claim 81 wherein the retainer member acts as a fluid seal for the variable fluid chamber prior to retraction.

93. (Previously presented) The syringe of claim 83 wherein the outer periphery of the plunger end cap is lodged in the barrel collar by pressing the plunger to cause retraction, thereby preventing subsequent withdrawal of the plunger from the barrel.

94. (Previously presented): The syringe of claim 81 wherein the plunger comprises a tip that extends forwardly of the plunger seal to initiate retraction.

95. (Canceled)

96. (Previously presented): A syringe assembly having a hollow body with an inside wall, a retractable needle, a needle retraction assembly seated inside the body and a plunger slidably engaging a portion of the inside wall,

the retraction assembly comprising a compressible retraction spring, a needle holder and a retainer member continuously surrounding the needle holder to hold the _retraction spring in compression prior to retraction, the inside wall and needle holder cooperating as a spring guide during compression of the retraction spring,

the plunger comprising a handle with a longitudinally extending retraction cavity having a first inside diameter and a forwardly extending tip having a second inside diameter less than the first inside diameter, the tip defining an opening through which the needle holder is receivable into the retraction cavity during retraction; a seal disposed in fixed longitudinal relation to the plunger handle and in sliding engagement with the inside wall of the body, and having a forwardly facing surface,

the body further comprising a rigid stop surface that is contacted directly by the forward facing surface of the plunger seal and stops forward movement of the plunger inside the body following release of the retractable needle.

Claims 97 – 106 (Canceled)

107. (Previously presented): The syringe of claim 58 wherein the plunger is vented.

108. (Previously presented): The syringe of claim 107 wherein the retraction cavity of the plunger is vented.

109. (Previously presented): The syringe of claim 81 wherein the needle retraction mechanism is insertable into the body through the second open end.

Claims 110-112 (Canceled)

113. (Previously presented): A syringe assembly having a retractable needle and designed for one-time use, comprising:

a hollow syringe body having a barrel further comprising a front end portion supporting a needle retraction mechanism comprising a needle holder and a compression spring having a forward end, the front end portion having a small diameter open end disposed forwardly of any larger diameter section of the barrel, wherein any forward movement of the needle holder relative to the barrel is limited by an annular shoulder disposed adjacent to and defining the small diameter open end at a narrowest part of the barrel, the annular shoulder being adjacent to the forward end of the spring.

114. (Previously presented): The syringe assembly of claim 113 wherein the needle holder abuts the annular shoulder.

115. (Previously presented): The syringe assembly of claim 114 wherein a portion of the needle holder extends forwardly of any portion of the barrel.

116. (Previously presented): The syringe assembly of claim 113, the hollow syringe body further comprising a back end portion having at least one radially extending member having a front side and a back side, the front side providing finger grips for the syringe body, and a collar comprising an open back end, the collar extending rearwardly of the back side of the at least one radially extending member and longitudinally separating the back side of the at least one radially extending member from the open back end; and

a plunger having a front end portion insertable into the barrel and slidably engageable with the inside diameter of the barrel in front of the at least one radially extending member, the plunger further comprising a retraction cavity adapted to receive a portion of the needle

retraction mechanism following retraction of the needle and a plunger end cap disposed rearwardly of the retraction cavity, the plunger end cap being receivable into close proximity with the collar following retraction.

Claims 117-121 (Canceled)

122. (Previously presented): A syringe assembly having a retractable needle that is rendered unusable after a single injection of fluid into a patient, the assembly comprising:

a hollow syringe body comprising a barrel and having a front end portion and a back end portion, the back end portion further comprising at least one radially extending member providing finger grips for the syringe body;

a retraction mechanism disposed in the front end portion, the retraction mechanism further comprising a needle holder having a head portion, an elongated needle holding portion, and a longitudinally extending fluid passageway through the head portion and the elongated needle holding portion, the head portion further comprising an inner head, a continuous retainer member surrounding the inner head, and a bridging portion disposed between the continuous retainer member and the inner head, wherein said bridging portion couples the continuous retainer member and the inner head to form a fluid seal between the fluid passageway and the barrel prior to retraction, and a compressed retraction spring surrounding at least part of the elongated needle holding portion and biasing the inner head toward the back end portion prior to retraction;

a retractable needle extending into the front end portion of the body through an opening in the front end portion of the body, the retractable needle being held in fixed relation to the elongated needle holding portion of the needle holder and in fluid communication with the longitudinally extending fluid passageway through the head portion and the needle holding portion;

a plunger reciprocally disposed inside the barrel and forming a variable chamber between the plunger and the needle holder prior to and during injection, the plunger being receivable into the barrel through the back end portion of the body and comprising an outer wall, a retraction cavity disposed inwardly of the outer wall, a plunger seal element providing sliding, sealed

engagement between the plunger and the barrel and preventing fluid leakage between the plunger and the barrel, the plunger seal element being restrained from sliding longitudinally along the outer wall of the plunger, and a back end with an end cap having an outer periphery; and

a barrier disposed in the front end portion of the body that limits forward motion of the needle holding portion and the retractable needle relative to the body as the plunger is depressed inside the barrel during injection and retraction;

wherein the continuous retainer member is releasable from the inner head of the needle holder when the plunger is further depressed inside the barrel following injection.

123. (Previously presented): The syringe assembly of claim 122 wherein the retraction mechanism is receivable through the back end portion of the barrel.

124. (Previously presented): The syringe assembly of claim 122 wherein the plunger carries a tip that protrudes forwardly of the plunger seal element to contact the needle holder and release the retractable needle when the plunger is further depressed inside the barrel following injection.

125. (Previously presented): The syringe assembly of claim 124 wherein the continuous retainer member is released from the inner head of the needle holder by means of a force applied by the tip to the needle holder.

126. (Previously presented): The syringe assembly of claim 122 wherein the body further comprises a collar having an open back end, the collar extending rearwardly behind the at least one radially extending member and longitudinally separating the at least one radially extending member from the open back end, and wherein the outer periphery of the end cap is in close proximity to the back end of the collar following injection and during retraction.

127. (Previously presented): The syringe assembly of claim 126 wherein the end cap is lodged in close confinement with the back end of the collar after retraction.

128. (Previously presented): The syringe assembly of claim 122 wherein the barrel is not distorted during retraction.

129. (Previously presented): The syringe assembly of claim 122 wherein the barrier is an annular shoulder disposed in the front portion of the barrel.

130. (Currently amended): The syringe assembly of claim 129 wherein the annular shoulder is disposed adjacent to the opening in the front ~~open~~ end portion of the body.

131. (Previously presented): The syringe assembly of claim 129 wherein the needle holding portion is grounded on the annular shoulder.

132. (Previously presented): The syringe assembly of claim 122 wherein the body has a rigid stop surface that is contacted directly by the plunger seal and stops forward movement of the plunger inside the body when the plunger is further depressed inside the body following injection.

133. (Previously presented): The syringe assembly of claim 122 wherein the end cap has an opening and a closure is installed in the opening.

134. (Currently amended): The syringe assembly of claim 122 wherein the ~~plunger~~ retraction cavity is vented behind the plunger seal element.

135. (Currently amended): The syringe assembly of claim ~~122~~ 134 wherein the retraction cavity is vented between the ~~retraction cavity~~ plunger seal element and the end cap.

136. (Previously presented): The syringe assembly of claim 122 wherein the body comprises a one-piece barrel.

137. (Previously presented): The syringe assembly of claim 122 wherein the continuous retainer member is coupled to the inner head with a holding force that exceeds a biasing force exerted on the inner head by the compressed retraction spring.

138. (Previously presented): The syringe assembly of claim 122 wherein a portion of the elongated needle holding portion extends forwardly of the body.

139. (Previously presented): The syringe assembly claim 122 wherein the continuous retaining member has an outside mating surface making a fluid seal with the barrel.

140. (Previously presented): The syringe assembly of claim 122 wherein the body and the elongated needle holder cooperate as a spring guide during compression of the retraction spring.

141. (Previously presented): The syringe assembly of claim 122 wherein the bridging portion is frangible.